REMARKS

Claims 1-8 are pending. By this response, claims 1 and 5 are amended. Reconsideration and allowance based on the above amendments and following remarks are respectfully requested.

The Office Action rejects claims 1-8 under 35 U.S.C. §103(a) as being unpatentable over Ishigami, et al. (US 2002/0118291 A1) and Hatlestad (US 5,555,464). This rejections is respectfully traversed

As recited in claims 1 and 5, the photosensitive cells are arranged bi-dimensionally so that each photosensitive cell is shifted in position from adjoining photosensitive cells in both the horizontal and vertical direction. The primary colors R, G and B are arranged in a vertical stripe pattern in which the segments of the same color form a column in the vertical direction. The transfer electrodes are positioned at an odd or even number of lines. Claim 1 recites a specific relationship between a first, second and third transfer electrode which allows for the forming of at least one vacant packet between packets holding the signal charge transferred from the vertical transfer path.

Thus, as described above, the present invention provides a solid state image pick-up apparatus in which color filter segments are arranged in a so-called honeycomb structure where the photosensitive cells are arranged with each cell shifted in position from adjoining ones of the cells. The color filter segments are arranged in an RGB vertical stripe pattern. In the preliminary pick-up mode, the solid state image pick-up apparatus utilizes the advantage of the honeycomb

structure to read out pixels from the photosensitive cells with odd or even numbered vertical columns reduced thereby accomplishing pixel reduction in the horizontal direction.

In contrast, Ishigami teaches a color filter segment array that is in a conventional square lattice structure. This is contrary to the honeycomb structure of the present invention. In Ishigami's device, a plurality of transfer electrode 7 are arranged to form four portions 7W, 7X, 7W and 7Z. The two adjacent transfer portions compose one bit so as to avoid colors to be mixed. See paragraphs 77 and 79. A driving pulse H1 to H4 is applied to the transfer electrodes in a horizontal transfer path (horizontal CCD to register).

However, Ishigami fails to teach the alternating honeycomb structure as defined by the claimed shifted positions of the photosensitive cells. Further, as recognized by the Office Action, Ishigami fails to teach or suggest a color filter arrangement in an RGB vertical stripe pattern.

The Office Action alleges that Hatlestad teaches a RGB vertical stripe pattern and this teaching could be combined with Ishigami's teachings to provide applicant's claimed features. Applicant respectfully disagrees.

Hatlestad discloses a color filter arranged in an RGB vertical stripe pattern as illustrated in Fig. 2. However, applicant respectfully submits that this particular teaching even if it could be combined with Ishigami, which applicant does not admit, would not lead to the claimed features. Specifically, the arrangement of an RGB vertical stripe pattern in Ishigami's system would not

achieve the horizontal reduction in accordance with applicant's invention as applied to the photosensitive cell positions, i.e., honeycomb structure. Further, as stated above, Ishigami teaches the driving pulse which is applied in a horizontal transfer path. Even if Ishigami could be modified to vertically reduce pixels, signal charges would be transferred from all vertical transfer paths (vertical CCD registers) to the horizontal transfer path. Thus, all signal charges in a row or horizontal direction would be transferred to the horizontal transfer path and not provide the claimed vertical transfer path.

Applicants note that in accordance with applicant's invention, vertical reduction or thinning allows signal charges to be read out in a way corresponding to the horizontal reduction. In order for Ishigami to accomplish the horizontal reduction of pixels, electrodes for supplying first and second driving pulses Φ SG1 and Φ SG2, as shown in Fig. 14, are formed on the columns of the vertical transfer path, and the horizontal transfer path has its nil state formed free from signal charges or is provided with a barrier for separating colors in order to avoid color mixture. Alternatively, as shown in Figs. 16, Ishigami's system is required to provide the gate portion 44 and the drain region 42 below the horizontal transfer path 5. In contrast, since applicant's invention employs an array of photosensitive cells in the honeycomb structure, it is not necessary to form a gate and a drain or wiring electrodes for selecting the columns of the vertical transfer path as suggested in Ishigami, but to simply perform vertical reduction of pixels to thereby read out signal charges in a way corresponding to horizontal reduction. The

present invention does not employ the complex structure as taught by Ishigami, but instead RGB vertical stripe pattern to read out RGB colors on each line to allow a full color signal to be generated from an information carried on one line.

Thus, the combination of Ishigami and Hatlestad teachings would not result in applicants claimed features. Therefore, a proper rejection under 35 U.S.C. §103 has not been established. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For at least these reasons, it is respectfully submitted that claims 1-8 are distinguishable over the cited art. Favorable consideration and prompt allowance are earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad J. Billings (Reg. No. 48,917) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
Michael K. Mutter
Reg. No. 29,680

MKM/CJB:cb

0378-0371P

Attachment(s)

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000